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ABSTRACT

Designed to provide the librarian with suggestions and guidelines for storing and preserving audiovisual materials, this pamphlet is divided into four major chapters: (1) Normal Use Storage Conditions; (2) Natural Lifetime, Working Lifetime and Long-Term Storage; (3) Handling; and (4) Shelving of Normal Use Materials. Topics addressed include: temperature and humidity; dangers of sunlight and heat, magnetic fields, and dust; cleaning and maintenance of audiovisual equipment; natural lifetimes of photographic films, recording tapes, and plastics; need for care in handling audiodiscs, photographic film materials, and magnetic recording tapes; and methods of shelving visuals (overhead transparencies, slides, filmstrips, filmloops, and cine films), audio and video discs, audio and video recording tapes (open reel and cassette), and multimedia packs of programs with two or more components. A brief concluding statement and three references are provided. (JB)

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AV in action

Storage, handling and preservation of audiovisual materials

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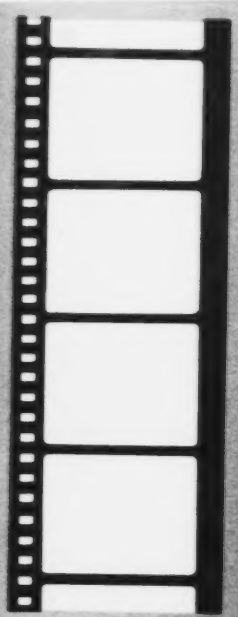

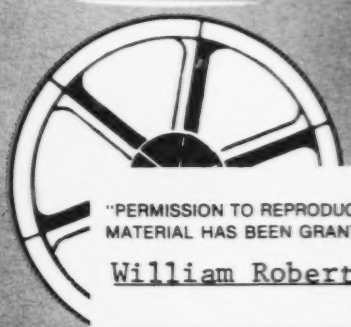

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AV in action 3

Storage, handling and preservation of audiovisual materials

Anthony Hugh Thompson,
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edited by
The IFLA Round Table on Audiovisual Media

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Authors note
The term *Audiovisual* is used throughout as a generic term, covering materials that are audio, visual or both.

Photographs included in the text are made from slides taken by the author.

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My sincere thanks to my wife Jan Russell, B.A., Dip. Lib., and my colleague Chris Baggs, B.A., M.A., Dip. Lib. for their encouragement and help, and for rearranging my english into something recognisable.

Foreword

The storage, handling and preservation of audiovisual materials is of fundamental interest to any librarian concerned with the provision and use of these items. Often, as in the case of video and film, they are expensive; often they are unique in that they may be the only existing recordings of particular occasions. Books and periodicals need relatively simple accommodation requirements: paper is reasonably durable and can last centuries given suitable conditions and careful handling. Audiovisual materials, on the other hand, often need additional packaging if they are to be stored on library shelving and, because of the substances from which they are made, e.g. acetate based materials such as film, they require special care in storage if they are to be preserved for a long time.

Certain problems are common to all types of library service, whether it is a public library, an educational library (in school, college or university), or an industrial or research association library. What is the best temperature at which to store audiovisual materials? How should they be handled? What is the best way to 'shelve' them? In the search for ideal conditions, temperature and humidity levels can be quoted and these are essential when considering the establishment of an archive collection. The correct way to handle materials is similarly a subject on which there is general agreement. It is the question relating to how to store or display audiovisual materials which cannot be answered categorically one way or the other and about which there is much debate. There are many ways of storing the various formats and the following pages indicate those which have been tried and tested.

It is the purpose of the library service, for whom it is intended, which will dictate how audiovisual materials will ultimately be stored. One organisation may adopt a variety of methods to meet a number of demands on its service. For example, a public library has lending and reference services; it may operate special distribution services to educational organisations, e.g. schools; it may provide materials for specialist groups of users, e.g. those in hospitals, those who are handicapped; it may also be a centre for local archives. Each service has its own problems. Lending collections of audiovisual

materials need suitable packaging to facilitate lending procedures; reference collections need to be reasonably accessible, to have adequate indexing in order to be exploited fully, and, in addition, the appropriate equipment must be nearby; an archive collection will need to apply special controls on the use of materials in order that they should be preserved.

The size of the collection is also an influential factor in the choice of storage system. Is it a large lending collection of twenty thousand discs and audiocassettes? Or a small specialist archive collection of fifty films which have been made locally? Is it possible to browse through the items or their containers if they are displayed? Should audiovisual materials be integrated with the bookstock, or should they be kept as a separate collection? These are all questions which the librarian must answer. Whatever method of storage is chosen, it is the needs of the library clientele which must predominate.

This booklet, which is the third in the series *AV in Action*, deals in depth with the problems outlined above. Mr. Thompson has also considered the implications for tropical climates as well as for more temperate zones. It is a publication which can be used in every type of library service on account of its very comprehensive treatment of the subject.

On behalf of the Round Table on Audiovisual Media, we would like to thank Mr. Anthony Hugh Thompson for contributing to the series and also for supplying the photographs which illustrate the text.

Catherine F. Pinion
Secretary
Round Table on Audiovisual Media

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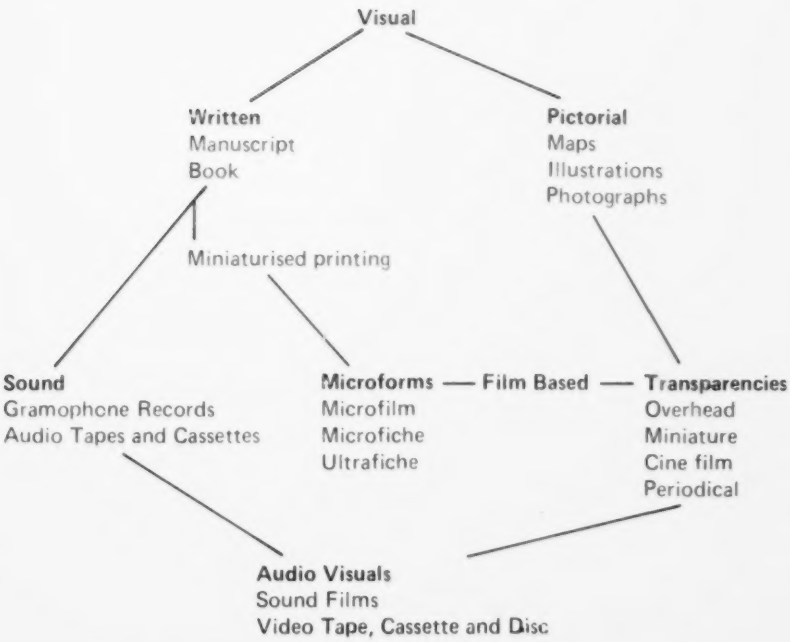
Chairperson
Round Table on Audiovisual Media

January 1983

Types of material

Three main types of material are used in the production of audiovisual software. Magnetic recording tape, a thin polyester base coated on one side with a variety of metal or metallic oxide powders, is used to record sound, video or computer information. Photographic film, a cellulose traicetate base coated on one side with photographic emulsions, is used for microforms, slides, filmstrips and cine film formats. Various plastics are used in the production of audio discs, video discs and overhead transparencies.



2 Normal use storage conditions

2.1 Temperature and humidity

Fortunately for the librarian, all these materials can be effectively stored for normal use in a library environment already suited to print based documents and although there are very slight differences in the recommended storage temperatures and the appropriate relative humidity for each of the three main groups of materials, a working temperature of 21°C ± 3°C (70°F) with a relative humidity of 50% ± 10% should prove to be perfectly acceptable for all library materials.

2.1.1 *Temperate Zones*

8 Libraries in temperate zones can usually achieve this temperature and humidity without the use of specialised air conditioning equipment. It is important however that the level of heating is kept fairly constant throughout the year and that central heating systems are not switched off when the library is not in use. As the temperature drops relative humidity rises and the condensation and dampness so produced lead to considerable damage to photographic film and, to a lesser extent, recording tape materials.

2.1.2 *Sub-tropical and tropical zones*

Here the same temperatures and humidity should be aimed for either through the use of full air-conditioning where audiovisual software is available throughout the library, or by partial air conditioning where software is confined to specific rooms. The former is to be preferred from a service point of view, but the latter may be the only economic solution.

The need to achieve the correct temperature is not quite so critical as the need to control relative humidity. Film and tape can stand temperatures up to 27°C/80°F, although this is hard on staff and users. Relative humidities above 60% however, especially when combined with higher temperatures, may lead to fungus growth both on film and tape based materials, causing irreparable damage.

Audiovisual storage area with full and auxilliary air-conditioning. (Hong Kong Public Libraries)

Air-conditioning, like heating, should be continuous and not turned off in audiovisual storage areas when buildings are not in use. However, many libraries turn off the full air-conditioning system when buildings are closed and rely on small mains electricity powered air-conditioning or humidity control units in the audiovisual storage areas. This does require extra equipment, and a constant electrical supply if this is to be effective.

Air-conditioning is expensive and some libraries do not have reliable electrical supplies. These reasons may contribute to some materials being stored in non-airconditioned areas. Experience would suggest that in tropical countries with fairly constant temperature and humidity conditions throughout the year, audiovisual materials stored in temperatures of 30°C+ with relative humidity of 80%+ may suffer only slow deterioration over a long period of time. In countries where extremes of temperature and humidity are experienced, materials in non air-conditioned storage may deteriorate very rapidly, fungus growth occurring within a few weeks. Only experimentation or storage over a period of time will show what effect these uncontrolled conditions have on individual library collections. However, some degree of deterioration is inevitable.

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2.2 **Sunlight and heat**

All audiovisual material must be stored away from direct sunlight which can distort audiovisual software, and at least one metre from any other source of heat, such as radiators and hot air vents.

2.3 **Magnetic fields**

All recording tape must be kept away from any electrical equipment which creates a strong magnetic field - flourescent lights, direct current electric motors, etc. While a few centimeters may be sufficient[3], in normal storage conditions a safety gap of half to one metre should be used to be absolutely safe. However, in archival collections a gap of 3-4 metres is recommended[1].

2.4 **Dust**

Dust - particularly windblown dust, sand or grit - constitutes a further hazard in multimedia collections. In countries where windblown dust is common, steps must be taken to ensure that the buildings are as dustproof as possible.

In all libraries however, all audiovisual software should be stored in some form of dustproof container; often the cover or package in which the material is supplied will be sufficient.

2.5 **Audiovisual equipment**

Equipment, as well as software, can be damaged by adverse conditions. In very dusty libraries, equipment should be kept covered except when in use; in less dusty environments it should be covered when the library is not in use. Regular equipment cleaning and maintenance programmes should be instituted to ensure that the equipment remains as dirt and dust free as possible, otherwise playback quality will be impaired and software irreparably damaged.

In high humidity conditions the equipment, especially video equipment, should be stored in air-conditioned areas with the audiovisual software.

3 Natural lifetime, working lifetime and long term storage

While the materials will store effectively for their normal working lifetime in the above conditions, libraries will need to keep some specialised materials - master tapes for duplication, original slides, etc. - for considerable periods and may also wish to keep some audiovisual materials for posterity, as with print.

3.1 Natural lifetime, working lifetime

Before considering conditions for long term storage it is necessary to examine the natural lifetime of these materials.

3.1.1 *Photographic films*

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a Black and white film. Properly processed and stored, the lifetime of this material is considerable, probably in excess of 200 years.

b Colour film. Here the lifetime is comparatively short and there is no way of preventing colour deterioration of the dyes used in photographic emulsions. Depending on use, processing and film stock, colour film may retain the correct balance for between 6 months and fifteen years, but certainly no longer. A colour slide projected continuously will show considerable deterioration of picture quality after 8-12 hours.

c Cine film, either black and white or colour, is physically damaged during the projection process, and the quality and cleanliness of the equipment, the condition of the film itself and the expertise of the projectionist will determine the lifetime of a projection copy. Given the right conditions, some 30 projections may be possible before damage is visible on the screen.

3.1.2 *Recording Tapes*

Here the polyester base of the tape will last in excess of one hundred years. It is too soon to be certain about the lifetime of the recording surface or the retention of the magnetic

pattern on it, but with modern tapes this could be 50 years or more. Certainly 1000+ playbacks can be obtained off good videotapes, and a higher number should be obtained off audiotapes.

3.1.3 *Plastics*

The plastics used for audio and video discs will remain in good condition for a considerable number of years, but where a stylus is used the playing surface will be damaged by repeated playings. 40-50 Issues of an audio disc from a lending library will normally be the maximum possible. Those audio and video discs which are read by a laser however, suffer no surface wear in the playing process and can expect a greatly increased lifetime as a result.

3.2 **Long term storage**

Ideally, a temperature of 6°C (42°F) and a relative humidity of 50%[1] will provide the optimum preservation conditions for film and recording tape materials. However as most libraries cannot afford to install an expensive temperature control plant, preservation copies should be stored in plastic bags inside suitable containers in a part of the library that remains as consistently cool as possible, provided the humidity is correct. Steel or wooden shelving can be used. There is little chance of producing steel shelving producing a strong magnetic field. Where a library has copies of cinematograph film in 35mm gauge, which were made before 1951, an immediate and careful check must be made on their condition, as the nitrate film base used for this gauge prior to the introduction of safety film in 1951, could now be in a highly dangerous condition and expert advice should be sought.

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Such film must always be stored separately from any other library materials as nitric acid fumes are produced in the irreversible deterioration process and these could cause considerable damage.

4 Handling

Audiovisual software needs to be handled with care. In general the surfaces containing the recorded information should not come into contact with any rough surfaces or be touched by hand, as fingermarks attract dust and other impurities in the atmosphere. This can lead to 'distortion' on playback, can be difficult to remove from recorded surfaces (particularly the grooves of audio discs and the emulsion side of photographic film) and can lead to permanent damage of the software.

4.1 Discs - Audio

These should be handled by the rim and label areas only and
14 stored inside the inner sleeve within the outer informative cover. The open end of the inner sleeve must face a closed edge of the outer cover thus forming a dustproof container.

A groove cleaner which tracks across the surface of the disc during playback should always be used; a static reducer can also be used to neutralise static charges that accumulate on plastic discs. Discs in a loan collection can also be cleaned as required with a 'Pixall' or similar roller cleaner which removes much of the surface dirt. A diamond stylus and light tracking weight should always be used for playback of long playing audio discs.

4.2 Photographic film materials

These should only be handled by the edges, unless approved cotton film handling gloves are worn. Filmstrips are best converted to slide formats, with glass mounting of slides being recommended for reference collections, slides for group presentation or for tape slide sequences. Master slides for duplication purposes are best kept in plastic mounts only, as glass mounts can lead to Newtons rings or similar patches which will appear on duplicate copies. When mounting slides or splicing cine film, film handling gloves should always be worn.

4.3 **Magnetic recording tapes**

The recording surface should not be handled except for repair or splicing purposes when film handling gloves can be worn for extra protection. Open reel audio tapes should be handled by the coloured leader tape only. It is debatable whether it is economic for library staff to repair damaged audio cassettes - this is a time consuming and awkward task and the condition or the rarity of the recorded material must influence the decision.

5 Shelving of normal use materials

The argument for and against the total integration of all library materials in one sequence will continue for years to come. There are practical reasons against total integration of all audiovisual software just as there are practical reasons for not integrating all bookstock into one continuous sequence. Some audiovisual formats - discs, audio cassettes for example - may suffer physical damage or loss if integrated with printed materials, while others have no browseable element until put onto their playback equipment. Partial integration however is possible and it is up to each librarian to decide which materials he will integrate into the main

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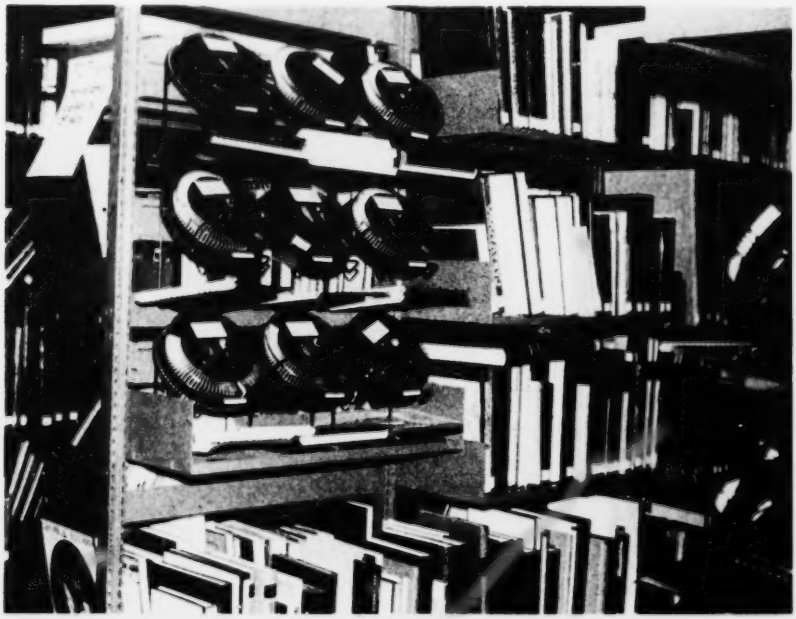

Partial integration. (Pompidou Centre, Paris)

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Partial integration. (Brighton Polytechnic Library, UK)

sequence and why. Both librarians and users however are perfectly accustomed to separate sequences of material, as long as their attention is drawn to these sequences effectively.

The use of special media containers which can be obtained from many library suppliers, and which allow audiovisual materials to be housed in a similar manner to books on ordinary library shelving, is to be recommended.
Virtually all audiovisual software can be stored on or in equipment used for the storage of printbased documents - the shelf and the filing cabinet - and it is logical and certainly more economical to continue this practice. Specialised media storage furniture is both expensive and inflexible, better the money be spent on more software. The following methods of shelving/storage have proved successful in a variety of libraries and the librarian can choose the methods most appropriate to his particular circumstances.

5.1.1 *Overhead transparencies*

A browseable format.

a Those published in book form can be shelved in the main sequence, if required.

b Individual overhead transparencies, whether published or in-house produced, should be mounted in a standard sized card frame (use one suitable manufacturers frame only) and stored in record browser boxes (in protective plastic bags if required) or in suspended plastic bags in metal vertical filing cabinets (jumbo size). Accompanying notes should also be stored in these bags. Transparencies may also be filed in the filing cabinet drawers like catalogue cards - if they tend to stick together interleave the transparencies with sheets of clean paper.

5.1.2 *Slide sets*

A browseable format. Sets of slides can be shelved:

a on open shelves in Kodak Carousel magazines. The outer box provided can also be used for added protection of the magazine. Some librarians have adapted the magazines so that for slide insertion, the top can only be removed by a member of staff.

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b in suspended plastic hangers in A4 vertical filing cabinets (up to 24 slides can be accommodated in one plastic slide hanger). This is the most easily browsed of the four methods, particularly if a slide light box is provided nearby.

c on open shelves in book-like containers with plastic pages for holding the slides. Such containers are produced by a number of library suppliers.

d on open shelves in ring binders with plastic pages for holding the slides. These are not so easily browsed through.

5.1.3 *Slides - individual*

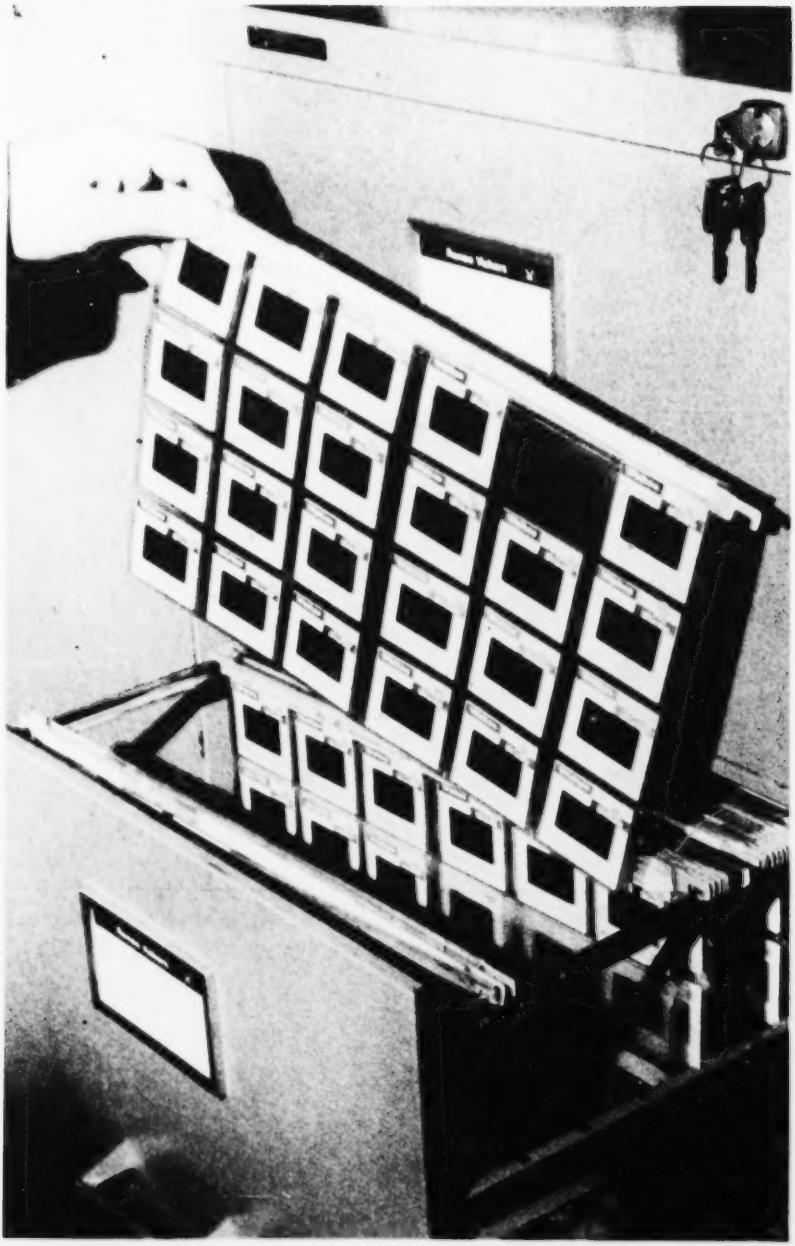
A browseable format.

As in 5.1.2 a and b above. Slide storage boxes should not be used in open access collections.

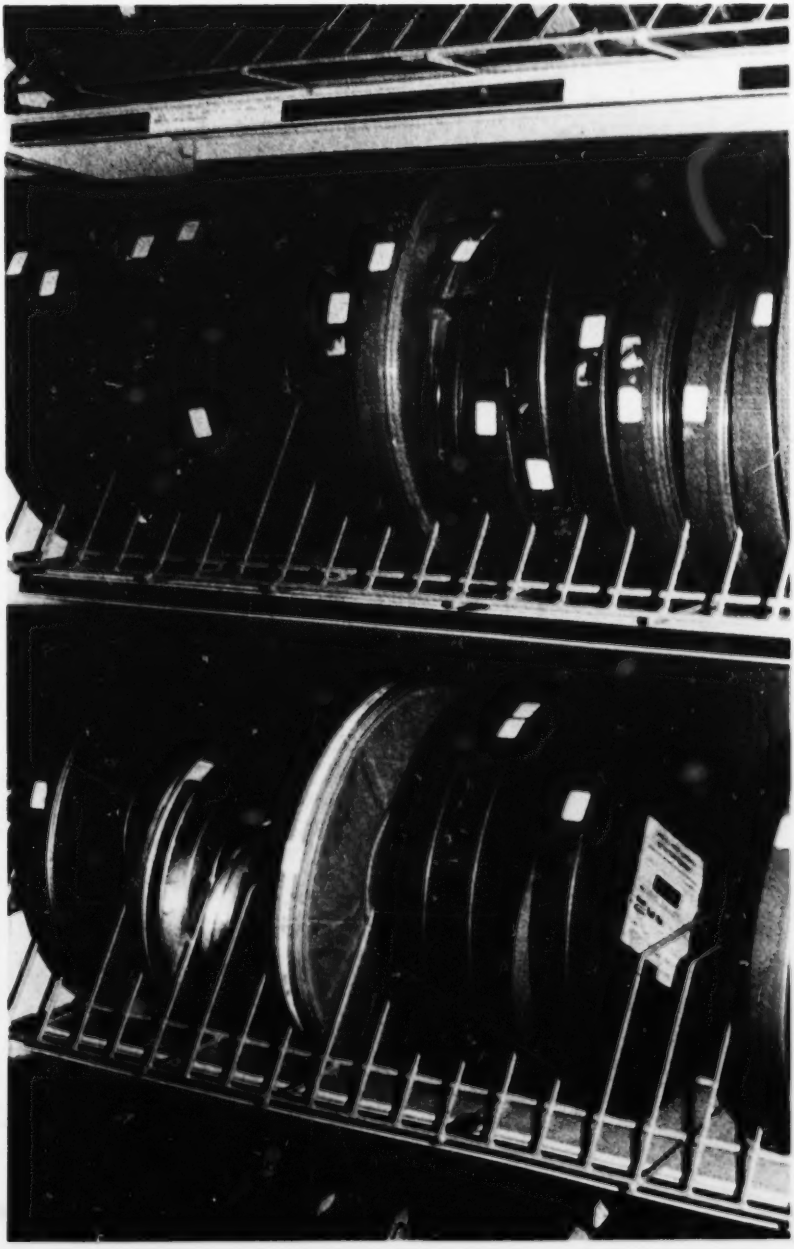
5.1.4 *Filmstrips*

A non-browseable format.

Filmstrips in their original form are not really suitable for library use as they are difficult to handle and are easily damaged during the projection process. They are best cut up and mounted in slide mounts and stored as in 5.1.2 above,



Slides stored in suspended plastic hangers. (College of Librarianship Wales)



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16mm cinefilm in filmracks on book shelves. (College of Librarianship Wales)

when they become fully browseable. Or they can be stored in their original form:

a in plastic containers in office stationery filing drawers. Notes have to be filed in a separate sequence.

b in small suspended plastic bags in A4 vertical filing cabinets. This allows for the notes to be stored with the filmstrips.

c in specially made or adapted boxes available from library suppliers, on open shelves in the main sequence. Notes can be kept in the boxes.

5.1.5 *Filmloops*

A non-browseable format.

Shelve upright in the cases in which they are supplied.

5.1.6 *Cine film*

A non-browseable format.

This should be shelved in metal or plastic cans (a decision on the use of the latter should be sought from the local fire officer) in commercially available film/computer tape racks, upright on shelves. A separate sequence is recommended here as film can easily be damaged by unskilled handling. For filing purposes the film title can be written on the edge of the can.

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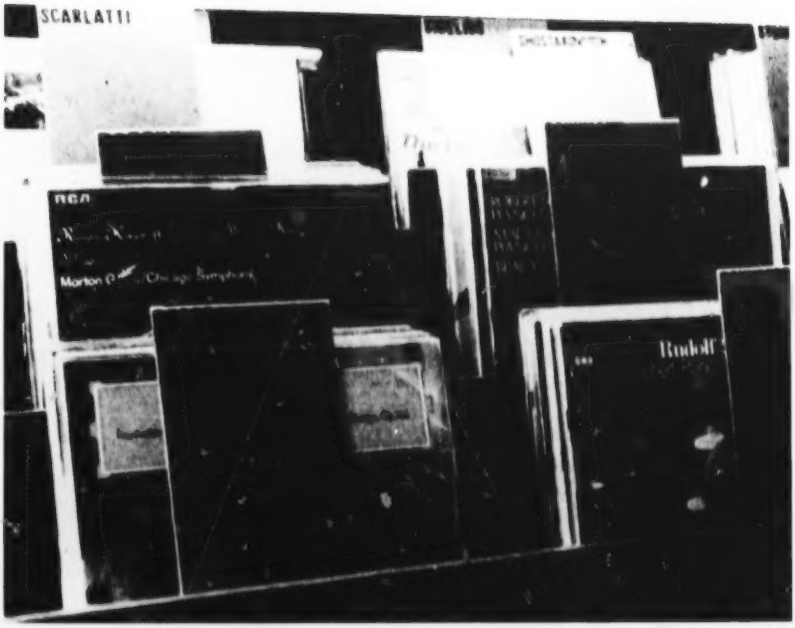
5.2 **Discs**

5.2.1 *Audio discs*

The disc itself is non-browseable but its outer cover is browseable.

a Loan collections. Here the use of browser boxes as found in record shops is ideal. The disc should be stored inside its protective covers and the use of a further commercially manufactured clear plastic outer casing is recommended to protect the cover during browsing.

b Reference collections. Either as in 5.2.1a. above or for best results the staff should handle and play the discs on the user's behalf, thus prolonging their life considerably. To help the user make his selection the outer information sleeve and external clear plastic cover should be stored in browser boxes while the disc itself is stored vertically in its inner sleeve in a card outer casing in a closed access sequence. They should be reasonably tightly packed on shelves some 35 cm apart with vertical dividers every 10cms. The disc should not be allowed to sag.



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Audio discs in browser boxes. (Camden Public Libraries)

5.2.2 *Video discs*

A non-browseable format with browseable cover.

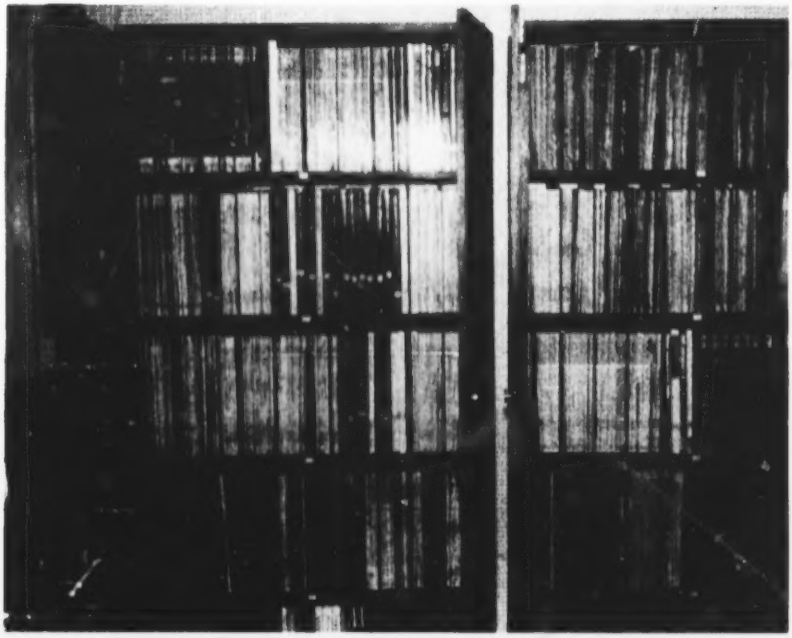
At the time of writing there is little experience of storing video discs in libraries. However, under no circumstances should Selecta-Vision or VHD discs be removed from their protective covers by staff or users. There is some evidence to suggest that Optical video discs show a tendency to sag in vertical storage and this can lead to warping which will significantiy affect picture quality. This warping can be corrected by shelving the disc flat for some time and can best be avoided initially by reasonably tight packing in the upright storage position. With these considerations in mind, video discs should store as audio discs.

5.3 **Recording Tapes**

5.3.1 *Open reel audio or video tapes*

Non-browseable formats.

Store in plastic bags in their containers upright on shelves. It



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Audio discs in reference storage. (Hong Kong Public Libraries)

is strongly recommended however that these materials should not be made available to users. The information thereon can be copied onto audio or video cassettes for normal use, subject to copyright regulations being observed.

5.3.2 *Audio cassettes*

As with discs, the cases contain browseable notes. The audio cassette also has an intrinsic value to some users regardless of the recording it contains and is very easily removed undetected from a library. All library cassettes should have the erasure prevention tabs on the back of the cassette removed before the cassette is made available. Where a high level of theft is involved librarians may wish to keep the cassette away from open display altogether.

a Cassettes in their cases, or the cases only with information notes, can be stored on shelves approximately 15cms apart. The use of plastic cassette racks to hold the cassettes slightly separated to facilitate shelving is recommended but is not essential.

b Cassettes in their cases, or the cases only with information notes, can be displayed in commercially produced cassette display racks. This makes an attractive display feature but occupies more space than shelving, and is clearly more expensive.

c Where cassettes are kept in closed access sequences separate from their display oases, they should be stored in duplicate plastic cases to avoid dust getting into the otherwise exposed cassette.

d Cassettes should not be shelved in the main sequence unless they are housed in a multimedia pack or a casing large enough to stop them being lost at the back of the shelf.

5.3.3 *Video cassettes*

A non-browseable format.

These should be shelved in their containers vertically, preferably in a separate sequence as they could get lost in a predominantly book sequence. The erasure prevention device, usually a tab on the rear of the cassette as with audio cassettes, should be removed.

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Video cassettes shelved vertically but on their sides to save shelf space. (College of Librarianship Wales)

5.4 **Multimedia packs or programmes with two or more components**

It is essential that the two or more components of a multimedia pack be kept together in one container. To split them up presents administrative problems for staff and annoyance for users.

a Shelve them in their original container or commercially available packs or boxes in the main sequence. A separate sequence may be necessary for large packs.

b Suspend contents in plastic bags in vertical filing cabinets.

6 Conclusion

These suggested storage methods are by no means exclusive and librarians will continue to devise new methods applicable to their own circumstances. However, whatever storage methods are used it is important to stress that differences in format do not necessarily require a different approach. The total separation of audiovisual software from print based documents, or the creation of audiovisual departments separate from the book material on the same subjects and staffed by different librarians are illogical developments and completely unhelpful to the library user. Integration of all information materials on the same subjects within the same library or department is recommended wherever possible, but
26 within that area the approach to the storage of these materials is a matter of choosing the most effective answer to the needs of that library and its users.

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